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The Great Human Capital Reallocation

A Study of Occupational Mobility in Transitional Russia

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This paper employs the Russian Longitudinal Monitoring Survey, a nationwide panel, to inquire into the magnitude, determinants, and consequences of occupational mobility in Russia from 1985 to 1998. We show that the restructuring process increases the rate of occupational reallocation. Structural changes account for a substantial part of the increase in gross occupational flows. A model built in the paper outlines the major explanatory factors of increased mobility during transition. The empirical analysis demonstrates that the destruction of existing jobs and occupations and the creation of new opportunities are important explanations for increased occupational mobility in transitional Russia. The econometric results also indicate that the local outside opportunities and the scale of structural change largely determine the probability of occupational switching.

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1. INTRODUCTION

"Four items matched" was the result of a JSTOR search on occupational mobility over the paper abstracts of 13 major economic journals. For a long time this important aspect of human capital reallocation has been virtually ignored in the economic literature. Recently several studies acknowledge this omission and have made attempts to fill this existing gap.

The analysis of occupational mobility has been conducted within different theoretical frameworks. Katherine Shaw (1987) employs a human capital investment model to examine how occupational change is associated with the intensity of occupational investment and the transferability of occupational skills. Brian McCall (1990) and Derek Neal (1999) develop a theory of occupational matching, in which an individual decision to switch occupations depends on the quality of the occupation-specific match. Nachum Sicherman and Oded Galor (1990) analyze the role of intra- and interfirm occupational mobility focusing on individual careers.

All of these studies admit that occupational mobility is a widespread phenomenon and that significant numbers of people switch occupations when switching jobs. It is rare to see workers performing the same tasks their entire working lives. Often people change their occupation to find a better match with their abilities and interests. However, as we argue in this study, certain economic conditions could also force occupational mobility. Structural and technological shifts could induce people to change their career despite a good occupational match or a well-established career path. In this study we will look beyond simple occupational matching or career development explanations of occupational mobility, examining this phenomenon also as an individual behavioral response to structural economic shocks in the labor market.

The transitional Russia, with a massive scale of restructuring, is an excellent setting in which to study large occupational changes caused by demand shifts. Building a new market economy makes the issues of skill transferability, worker career adjustment, and returns to investment in previous occupations especially important. Throughout this study we would like to learn more about individual behavior during the rapid transformation of economic valuation of existing and new occupations.

Our analysis of occupational mobility in Russia is built around the following seven questions.

First, what is the magnitude of occupational mobility in transition: does the restructuring process lead to a higher rate of occupational reallocation? We anticipate that the movement to a market economy should increase the rate of occupational transitions and cause considerable reallocation of Russian human capital towards market-oriented occupations. The question that we would like to address is what portion of increased occupational switches could be due to the restructuring process itself and what portion of them could be accounted for occupational mismatching, career development and other reasons.

Second, does the restructuring process change the structure and directions of occupational mobility? In this study four major distinctions in types of mobility are considered: intrafirm *vs*. interfirm, intraindustry *vs*. interindustry, within *vs*. between two-digit occupational categories, and downward *vs*. upward occupational mobility. We hypothesize that the structural changes make occupational mobility more "complex", defining the complexity of mobility as simultaneous changes in occupation, firm and industry (the same way as Neal, 1999). We hypothesize also that the restructuring environment reinforces interfirm and interindustry occupational mobility. Finally, we show the directions of occupational mobility and find increased flows to market-oriented and service-providing occupations.

The third question concerns the reasons for increased occupational mobility in transitional Russia. Why do occupational switches of different types occur more often now than before? On the one hand, it may be a result of the destruction of existing jobs and occupations. People are involuntarily forced to change their occupation because previously accumulated skills become obsolete and unusable. On the other hand, increased occupational mobility may reflect the creation of new opportunities. The increased demand for new market-oriented jobs gives people an incentive to move, to exploit other possible options, and to begin a new promising career. Our study shows that both explanations of increased occupational mobility in transition, destructive as well as creative, are taking place.

Our fourth question is what are the determinants of occupational mobility? Whether occupational change is caused by a decline in returns to a previous occupation or by an increase in returns to alternative options is an important point of interest. It is demonstrated that both factors strongly affect the probability of occupational switching. We examine also various individual and firm characteristics such as gender, tenure, experience, schooling, type of ownership, firm industry, and firm performance. The econometric results indicate that occupational mobility falls with tenure and experience. Firm characteristics such as type of

ownership, industry, and firm performance are also found to be an important determinant of occupational change.

The fifth issue concerns the impact of the local economic environment on occupational mobility. Here we begin with a question whether the magnitude and direction of occupational mobility are different across Russian regions. We hypothesize that local labor market conditions, which reflect an uneven speed of structural changes and unequal outside opportunities across regions, are critical determinants of occupational shifts. A diverse set of variables such as the job destruction rate, the employment concentration index, and the share of the employed in de novo firms are used to test the significance of local characteristics for occupational mobility. We are especially interested in testing the monopsony hypothesis, which suggests that limited outside opportunities and the large concentration of local employment in a few firms should restrict interfirm occupational mobility.

Sixth, we ask to what extent occupational reallocation increases the discrepancy between the previously accumulated human capital and market demand for skills. This issue is examined by comparing the field of study and subsequent occupational choice. Intuitively, we would expect the connection between previously acquired education and occupation in the market economy to weaken as a result of a transitional shock. Moreover, negative demand shocks may force downward occupational mobility and induce people to accept new jobs with lower skill requirements. Several measures of firm performance are used to show downward occupational mobility as a form of labor adjustment to negative demand shocks.

The final question is whether the change of occupations was successful for people? What are the returns to occupational mobility in terms of earnings and subsequent wage growth? Here we test two contrary hypotheses on the returns to occupational mobility. The "destructive" theory of occupational mobility suggests that people who are forced to move may lose some benefits they had in their previous occupation. They may agree to lower wages than they had before their career change. In contrast, the "creative" theory of occupational mobility suggests that the voluntary occupational switches in response to positive demand shifts and new opportunities bring additional benefits to an individual.

We examine these questions using the 1994–1998 wave of the Russian Longitudinal Monitoring Survey (RLMS).[1] The survey contains household

[1] The size of the adult sample varies from 8.342 in 1996 to 8.893 in 1994.

and individual data on employment, household income and expenditures, education, health conditions and other characteristics. The 1998 survey also includes retrospective questions about the past job experience of respondents and their occupations in the pre-reform period (1985 and 1991). We have upgraded this database substantially by identifying firms and industries where respondents work and by coding occupations, training courses and school majors. We have also matched these data with firm and regional information from the Goskomstat Registry of Industrial Firms and Goskomstat Regional Yearbook.[2] The panel structure of data and extensive coding work made the study of occupational mobility possible.

In spite of its social importance and policy relevance, unfortunately, the problem of occupational mobility has not received much attention in the literature on transition economies. To our knowledge, the only studies of migration from Eastern Europe and Russia that address these issues provide some evidence of downward occupational mobility and low skill transferability of migrants due to a large country-specific component of previous occupational investment.[3]

Two factors may contribute to the lack of studies in occupational mobility during the transition. First, the analysis of occupational changes requires longer time periods to investigate the major shifts in occupational composition. It also takes more time to accumulate data necessary for the analysis of human capital reallocation during transition. The second problem relates to the empirical definition of occupational mobility. As Shaw (1987) points out, a broad theoretical model of occupational change is inherently difficult to estimate due to the very idiosyncratic nature of occupational skills. Often occupational changes can not be quantified and modeled empirically. Serious measurement issues and coding problems also make an empirical analysis of occupational mobility extremely difficult. The development of appropriate longitudinal databases along with the improvement of conceptual definitions could help to overcome these limitations. This study makes a first attempt to examine the empirical patterns of occupational mobility in transitional Russia by using unique data with consistent multiple observations of each worker's occupational status over fourteen years (1985–1998).

Despite the scarcity of studies that specifically address occupational mobility in transition economies, we build on the previous literature that

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[2] This database was developed jointly with John Earle, with support from the MacArthur Foundation.

[3] See Bauer and Zimmermann (1999) for a review of literature on occupational mobility of migrants.

analyzes other relevant issues. In particular, we continue a discussion whether human capital accumulated in the previous system is useful in a market economy and whether skills gained under the centrally-planned economy are transferable. This issue was raised by several researchers in connection with their estimates of the returns to human capital (see Kertesi and Kollo (1999) for Hungary, Orazem and Vodopivec (1997) for Slovenia, Rutkowski (1997) for Poland, Nesterova and Sabirianova (1998) for Russia; an extensive review of this literature is done by Svejnar, 1999). Another strand of relevant literature focuses on various aspects of labor mobility in transition economies: sectoral shifts and job reallocation (Earle, 1997); flows between different states of the labor market (Boeri, Burda and Kollo, 1998; Foley, 1997; Ham *et al*., 1998); transitions to and from self-employment (Earle and Sakova, 1999); returns to labor mobility (Boeri and Flinn, 1999); the mobility effect of schooling and training (Orazem and Vodopivec, 1997; Berger, Earle and Sabirianova, 2000); *etc*. Some of the ideas in this literature have direct implications for the analysis of occupational mobility.

The rest of the chapter is organized as follows. In Section 2, we explain various measures of occupational mobility. Section 3 shows the magnitude and directions of occupational flows. Section 4 builds a model outlining the major explanatory factors of increased occupational mobility during transition. The empirical specification of the model is presented in Section 5. Section 6 tests the hypothesis on determinants of occupational mobility. Section 7 examines downward occupational mobility as a form of labor adjustment to negative demand shocks. The wage returns of occupational mobility are discussed in Section 8.

2. MEASURES OF OCCUPATIONAL MOBILITY

Before examining our hypotheses, it is worthwhile to discuss in detail measurement issues relating to occupational mobility. The data allow us to utilize two measures of occupational mobility. The first self-reported measure is drawn from the answers of respondents to the 1998 RLMS question "Did you change your place of work or occupation by comparison with December 1996?" Table 1A shows that 17% of employed respondents reported in 1998 that they changed their occupation along with their place of work, and 3.4% reported changes in their occupation within the place of work. Unfortunately this measure alone cannot be considered as a fully appropriate measure of occupational mobility. It is sometimes unclear what respondents meant by occupational changes. How did they define a place of work? For instance, mobility between

departments within a firm could be treated as a change of workplace. Based on this self-reported measure, we cannot infer the real magnitude of interfirm occupational mobility. Another serious limitation of this measure is a lack of time-series data, which is important to examine the transition effect on the magnitude and directions of occupational mobility.

Table 1A. Measures of Occupational Mobility, 1996–1998.

The self-reported measure of occupational mobility (individual report in 1998), %		The measure of occupational mobility based on differences in codes, %	
Place of work and occupation changed	17.0	Changed occupation	16.6
Occupation changed but not place of work	3.4		
Place of work changed but not occupation	9.3	Did not change occupation	83.4
Occupation and place of work remained the same	70.4		
N	4135		2888

In many respects, the differences in occupational codes are a better measure of occupational mobility. Occupational change is defined to occur when the occupational category in two successive years is different. This second measure has certain advantages. It permits us to study the major shifts in the occupational composition of the labor force from 1985 to 1998, to follow an occupational history of Russian workers, and to make a distinction between various types of occupational mobility (interfirm *vs*. intrafirm, upward *vs*. downward, *etc*.). However, a second measure also has some limitations. These are, first, the ambiguity of most occupational classifications and miscoding errors; and second, the existence of occupational shifts that are often not identifiable through codes.

In any study of occupational mobility, miscoding error is the most serious problem. Such error is especially common in panel data, in which codes are created for each cross-section separately without making them consistent over time. Different codes can be given to the same occupation if a respondent describes his/her occupation differently (for example, as an engineer in the first year and as a specialist in metallurgy in the second year). To measure occupational mobility accurately, the job descriptions for all years of longitudinal data should be considered simultaneously.

The original RLMS occupation codes were created in accordance with the four-digit International Standard Classification of Occupations (ISCO–88) by using a specially designed computer program of occupation recognition and extensive reconciling of codes in each cross-section afterwards. However, consistent codes within a cross-section do not necessarily make them consistent across years. For example, based on the difference in four-digit original codes, we could conclude that 50.3% of employed respondents changed their occupation over one year (1994–1995)! The original RLMS codes exhibit extremely high rates of occupational mobility that are doubtful.

The miscoding error within the one-digit ILO categories may be partially eliminated by using more aggregated occupational groups. Unfortunately 21% of miscoded cases in the RLMS are between one-digit categories, as can be seen from Table 2A. These inconsistencies are more serious and produce spurious occupational mobility. Some examples of miscoding errors are listed in Table 2B.

To avoid such inconsistencies, we created new occupation codes, which are consistent for every individual across years. Our new occupation codes are also based on the four-digit International Standard Classification of Occupations (ISCO–88) and Russian Classification of Occupations (RCO–93), and are drawn from several RLMS questions: "What do you work as?", "Please, name the profession in which you work, in what profession do you work?", and "What do you primarily do at your work, what are your primary responsibilities?"[4]

As we can see from Table 2A, new occupation codes produce more or less reasonable estimates of occupational mobility: 11% of respondents change their occupation each year, in contrast to the 50% rate of occupational mobility based on the original RLMS codes. These newly constructed measures are very close to the self-reported ones. Table 1B shows that two measures are the same in 89.4% of all cases for 1996–1998.

[4] The information on occupations and jobs in the pre-transition era (1985 and 1991) is based on retrospective data collected in 1998. Respondents' answers may suffer, therefore, from recall errors, which are difficult to measure. However, the strong attachment of Russian workers to one job in the Soviet period reduces the recall error. In addition, 1985 and 1991 years are memorable break points in the Russian history. In 1985 Gorbachev came to power and perestroika began. In 1991 Boris Eltsin became elected president of Russia, Soviet Union ended, Gorbachev resigned, and Gaidar started radical economic reforms. 94.9% (96.6%) of respondents employed in 1985 (1991) gave a precise name of their occupation. Hence the recall error should not impact results significantly.

Table 1B. The Comparison of Two Measures of Occupational Mobility, 1996–1998.

The measure of occupational mobility based on differences in codes	The self-reported measure of occupational mobility		
	Did not change occupation	Changed occupation	Total
Did not change occupation	2273 [79.0%]	127 [4.4%]	2400 [83.4%]
Changed occupation	178 [6.2%]	298 [10.4%]	476 [16.6%]
Total	2451 [85.2%]	425 [14.8%]	2876 [100.0%]

Note: The self-reported measure of occupational mobility is drawn from the answers of respondents to the 1998 RLMS question "Did you change your place of work or occupation by comparison with December 1996?" This question was not included in the previous RLMS rounds. The second measure of occupational mobility is defined as the difference between four-digit occupational categories.

Table 2A. Measurement Error in Occupational Codes.

	Rounds 5 and 6 (1994 and 1995)	Rounds 6 and 7 (1995 and 1996)
Difference in original RLMS four-digit occupational codes between rounds (%)	50.3%	48.4%
Difference in reconciled RLMS four-digit occupational codes between rounds (%)	11.4%	11.1%
Percentage share of miscoded cases	39.3%	37.9%
Miscoding error within one-digit ILO occupational category	79.2%	79.0%
Miscoding error between one-digit ILO occupational categories	20.8%	21.0%
N	3442	3324

Note: The differences in original and reconciled RLMS occupational codes are defined at four-digit level; the ILO category represents one-digit level of occupational classification.

Table 2B. Examples of Miscoding Error in RLMS Occupational Codes.

Actual occupation	Examples of codes
Examples of miscoding error within 1-digit ILO occupational category:	
Engineer–mechanic	2142 — Civil engineer 2145 — Mechanical engineer 2149 — Other engineers
Plasterer–Painter ("Stukatur–malyar")	7133 — Plasterers 7141 — Painters and Related Workers
Examples of miscoding error between 1-digit ILO occupational category:	
Guard ("Ohrannik")	9152 — Doorkeepers, watchpersons and related workers 5169 — Protective services workers not elsewhere classified
Nurse assistant or helpers in hospitals ("Sanitar")	3231 — Nursing associate professionals; nurses without higher education 5132 — Institution-based personal care workers 9132 — Helpers and cleaners in offices, hotels and other establishments
Accountant–cashier ("bukhgalter–kassir")	2411 — Accountants 3433 — Bookkeepers 4121 — Accounting and bookkeeping clerks 4211 — Cashiers and ticket clerks

The other problem in the measurement of occupational mobility is the existence of occupational changes, which are not captured by the differences in codes. First, the differences in codes may not reflect changes in definitions of occupations over the time. In some cases the name of an occupation could remain the same, but the content of work, tasks and duties could change substantially. For example, the working behavior of salespersons or any other service workers is different in centrally planned and market economies. We will address this issue in the next chapter.

Second, the differences in codes underestimate actual occupational flows due to the omission of return occupational mobility when people return to their previous occupation after being employed temporarily in some other occupations. But, according to the RLMS, the phenomenon

of return mobility is not very common in Russia. Only 2.4% of respondents with the same occupations in 1994 and 1998 had different occupations in 1995 or 1996 (about 6.1% of occupational movers between 1994 and 1998).

Third, it is extremely difficult to identify changes in occupational status within the firm. For example, promotion from foreman to shiftman, or from assistant professor to full professor is not accompanied by changes in occupational codes.

In this study we do not consider occupational changes within a four-digit occupation category. Occupational mobility is measured only as the difference between four-digit reconciled codes. The same coding procedure applied for every respondent across all years reduces the probability of miscoding error. Consistent occupational codes allow us to compare occupations across years and to distinguish occupational switches correctly.

3. THE TRENDS OF OCCUPATIONAL MOBILITY

We begin by comparing the magnitude of occupational mobility in the pre-reform (1985–1991) and reform period (1991–1998) in the data set that we will be using to test hypotheses. Our interest here is to see whether the restructuring process is stimulating more occupational reallocation.

Table 3 shows the size of gross, adjusted and net occupational flows. Gross occupational flows are measured as the fraction of employed respondents who changed occupations between the first year and last year of the considered periods. To control for the age effect on mobility, gross flows were also adjusted by estimating the predicted probabilities of occupational switches obtained from a probit equation of occupational mobility on the 7^{th} order polynomial extension in age evaluated at age in 1998. Both gross and adjusted measures show an unambiguous increase in occupational transitions after 1991, the year when reforms begin. The number of people who moved to another occupation was considerably higher during the first four years of reforms (1991–1995) than during the preceding six years (1985–1991). For seven years of transition, 1991–1998, 42% of employed respondents changed their occupation, which is nearly twice as great as the share of occupational movers in the previous six pre-reform years. Table 3 also indicates that the occupational flows were the most intense during the first five years of reforms. After 1996 the rate of occupational mobility begins to fall.

This could be partially due to the diminishing rate of structural change and to the relative stabilization of occupational composition.

Table 3. Gross and Net Occupational Flows.

	Occupational flows			Index (net/gross)	N
	Gross	Adjusted	Net		
1985–1998	0.497	0.588	0.241	0.485	2549
1985–1991	0.219	0.236	0.079	0.361	3817
1991–1998	0.422	0.391	0.207	0.491	3103
1991–1995	0.287	0.348	0.128	0.446	2725
1994–1998	0.284	0.338	0.110	0.387	2409
1994–1996	0.177	0.211	0.069	0.390	2966
1996–1998	0.166	0.179	0.057	0.343	2888

Note: Gross occupational flows are fractions of employed respondents who changed occupation between the first year (t_0) and last year (t_1) of the considered periods. Adjusted occupational flows are predicted probabilities of occupational switch evaluated at age in 1998 (obtained from probit equation with 7^{th} order polynomial expansion in age). Other functional forms of probit equation produce similar results. Net occupational flows are computed as a sum of absolute differences between the fractions of employment in each occupation at time t_0 and time t_1 divided by two. All occupational switches are estimated based on the differences in four-digit occupational codes.

Next, we consider whether these occupational switches result in labor reallocation across occupations. One might think that increased mobility reflects an increase in occupational mismatching, imperfect information, or general uncertainty of the transition period. If this were the only explanation, then we would not observe shifts in the occupational composition of the labor force. Most moves between occupations must cancel out. The alternative explanation for increased occupational mobility is structural changes that cause occupational reallocation. To estimate the degree to which occupational mobility is associated with structural changes we compute net occupational flows in a similar fashion as Jovanovic and Moffitt (1990) do with respect to sectoral labor reallocation.

The net occupational flows between the first year (t_0) and last year (t_1) of the considered period are computed as follows:

$$\frac{1}{2}\sum_j \left|\pi_{j,\,t_0} - \pi_{j,\,t_1}\right|,$$

where $\pi_{j,\,t_0}$ is the fraction of employment in occupation j at time t_0.

One finding is striking: net occupational flows are responsible for a large share of gross flows. Table 3 shows that almost 50% of all switches are associated with changes in the occupational composition of the labor force from 1985 to 1998. Another interesting observation is a clear upward shift in the share of net occupational flows during the transition period. This result suggests that structural factors came to play an increasing role in explaining occupational mobility. However, in the latest years of transition the share of net occupational flows tends to decline. It may indicate again that the major structural changes in occupational composition occur during the early transition period.

We also look at different types of occupational mobility to examine whether the restructuring process is stimulating certain types of occupational mobility. As Table 4 indicates, the share of people who change occupation when changing firm or industry increased for 1991–1998 compared to 1985–1991 (with a decline in 1996–1998). The data show that the structural reforms reinforce complex switches, defined as simultaneous changes in occupation, firm and industry.

Table 4 also shows that occupational transitions within an occupational group (2-digit) are not very common. Between-group flows are responsible for more than 80% of all occupational switches. The share of switches between groups remains relatively constant over time, except for an increase between 1996 and 1998.

We also see a strong increase in the magnitude of flows to service-providing occupations. The gross magnitude of flows to these activities for 1991–1998 is almost three times higher than during the pre-reform period. Evidently the occupational composition is shifting toward more market-oriented and service-providing activities, which can also be seen through the direct comparison of the occupational structures in 1985 and 1998, as shown in Table 5. We observe an increase in the share of managers, entrepreneurs, specialists in business and law, customer service clerks, salespersons, and other service-providing workers. At the same time the recent occupational changes are characterized by a strong decline in a number of engineers and skilled laborers that may reflect a shift of employment from good-producing industries to service-providing industries.

Table 4. Trends of Occupational Mobility.

	1985–1998	1985–1991	1991–1998	1991–1995	1994–1998	1994–1996	1996–1998
Gross occupational mobility (Table 3)	0.497	0.219	0.422	0.287	0.284	0.177	0.166
Complex mobility	–	0.153	0.296	–	0.183	0.110	0.096
Share of complex switches among all movers	–	49.2%	56.1%	–	49.1%	47.8%	39.9%
Interindustry occupational mobility	0.357	0.154	0.300	0.188	0.183	0.110	0.096
Share of occupational switches among interindustry movers	75.9%	67.9%	74.1%	69.3%	70.7%	69.1%	60.6%
Interfirm occupational mobility	–	0.161	0.305	–	0.192	0.113	0.102
Share of occupational switches among interfirm movers	–	63.2%	73.9%	–	68.8%	68.2%	57.8%
Occupational mobility							
Between groups	0.423	0.184	0.352	0.239	0.237	0.143	0.146
Within a group	0.074	0.035	0.070	0.049	0.047	0.033	0.020
Share of between group switches	85.1%	84.2%	83.4%	83.0%	83.6%	81.1%	87.9%
Transitions to service-providing occupations	0.171	0.056	0.150	0.094	0.089	0.053	0.055
Share of switches to service-providing occupations	34.4%	25.7%	35.5%	32.6%	31.3%	29.8%	33.3%

Note: Gross, interindustry and interfirm occupational switches are defined based on the differences in four-digit occupational codes. Occupational group is defined at two-digit level. Thus, occupational mobility between groups reflects mobility between two-digit occupational categories. Occupational mobility within a group is defined as the difference between four-digit occupational codes within a two-digit occupational group. The list of two-digit occupational groups is given in Table 5.

Table 5. Changes in Occupational Composition Between 1985 and 1998, %.

One- and two-digit occupational categories	1985	1991	1998	% change 1985–1998
Officials and managers				
Officials	0.20	0.09	0.14	−30.0
Corporate managers	0.62	0.77	1.53	146.8
Small firm managers	0.66	0.91	1.98	200.0
Entrepreneurs and independent farmers	0.00	0.21	1.79	$+\infty$
Professionals				
Physicists, mathematicians, and engineers	6.47	5.87	3.59	−44.5
Life science and health professionals	1.92	2.04	2.31	20.3
Teaching professionals	3.56	3.61	4.39	23.3
Business and law professionals	1.70	1.72	2.05	20.6
Other professionals	0.86	0.74	0.80	−7.0
Associate professionals				
Technicians	3.62	3.44	3.82	5.5
Life science and health associate professionals	2.96	3.10	3.94	33.1
Teaching associate professionals	2.34	2.74	2.55	9.0
Finance and business associate professionals	1.48	1.64	1.77	19.6
Other associate professionals	4.84	4.85	4.70	−2.9
Clerks				
Office clerks	5.85	5.65	5.03	−14.0
Customer services clerks	1.37	1.68	1.91	39.4
Service workers				
Personal services workers	2.43	2.36	2.88	18.5
Catering services workers	1.97	2.08	0.99	−49.7
Protective services workers	1.02	1.45	3.42	235.3
Salespersons	2.72	2.78	4.56	67.6
Craft workers				
Extraction and building trades workers	4.09	3.66	3.90	−4.6
Metal and machinery workers	12.79	12.76	9.47	−26.0
Other craft workers	2.72	3.27	2.95	8.5
Operators and assemblers				
Stationary-plant operators	3.25	3.51	3.40	4.6
Machine operators and assemblers	3.09	2.51	2.12	−31.4
Drivers and mobile-plant operators	14.03	13.88	11.47	−18.2
Elementary occupations	11.95	10.88	11.21	−6.2
Military specialists	1.50	1.79	1.30	−13.3
N	4527	4704	4236	

Note: The last column indicates the positive or negative changes in the share of each type of occupations.

To summarize, the data provide strong evidence of a significant positive impact of the restructuring process on the magnitude of occupational mobility. Structural changes account for a substantial part of the increase in gross occupational flows. But there are differences in the empirical patterns of occupational mobility during the early and late stages of the transition period, with more intense flows and larger structural reallocation in the earlier years. We have also documented the large share of complex occupational switches and considerable flows to service-providing occupations.

4. THEORETICAL FRAMEWORK

In this section, we will briefly lay out a model of individual decisions concerning occupational change. The model is designed to outline the major explanatory factors of occupational mobility that will be examined in the next sections.

Let V_i denote the gross earnings while employed in occupation i. The gross earnings can be partitioned into earnings capacity not varying across occupations (E), returns to present investment in occupation i ($r_i K_i^t$), returns to past investment in occupation i ($r_i K_i^{t-1}$), and a term attributed to occupational matching (ε_i). The last term represents the value of occupation-specific information that arrives randomly and affects gross earnings additively. Assuming that an individual works only for two periods, the equation for gross earnings can be written as:

$$V_i = E + r_i\,(K_i^t + \beta K_i^{t-1}) + \varepsilon_i = E + r_i K_i^* + \varepsilon_i\,, \qquad (1)$$

where β is the discount rate and $r_i K_i^*$ is the discounted value of returns to the total investment in occupation i ("returns to the current occupation").

Now suppose that an individual switches occupations at the end of period $t-1$. His/her gross earnings while employed in occupation j will consist of earnings capacity (E), the returns to present investment in occupation j ($r_j K_j^t$) and returns to the transferable part of past investment in occupation i ($r_j \gamma_{ij} K_i^{t-1}$). An occupational matching term goes to zero at the beginning of work in occupation j. It modifies the equation for the gross earnings from employment in occupation j in

the following way:

$$V_j = E + r_j\left(K_j^t + \gamma_{ij}\beta K_i^{t-1}\right) = E + r_j K_j^* , \quad (2)$$

where γ_{ij} is the skill transferability index that shows the proportion of investment in occupation *i* which is transferred to occupation *j* and $r_j K_j^*$ is the discounted value of returns to the total investment in occupation *j* ("returns to the alternative occupation").

At the end of period $t-1$ an individual has two choices: remain in the current occupation or switch occupations if $V_j - V_i > c$, where c is the cost of occupational change contingent on individual switching cost and local outside opportunities.

Applying Equations (1) and (2), we obtain the probability of occupational change:

$$\Pr(V_j - V_i > c) = \Pr(r_j K_j^* - r_i K_i^* - \varepsilon_i > c) . \quad (3)$$

The model predicts that the probability of a change increases with a decline in the returns to current occupation ($r_i K_i^*$), with an increase in the returns to alternative occupations ($r_j K_j^*$), with the transferability of skills between occupations (γ_{ij}), with lower mobility costs (c), and with lower quality of the occupation-specific match in current occupation (ε_i). The last factor becomes especially important under stable economic conditions when wage distribution across occupations and returns to occupations remain relatively constant.

But the restructuring process may bring some other factors into play. Among those are changes in the wage distribution across occupations, creation of new-type occupations and destruction of old ones, an increase in demand for market-oriented skills, *etc*. Transition to a market economy may also affect the skill transferability between occupations due to a system-specific shock causing the destruction of occupations with a large system-specific component.

For the purpose of our analysis, it is important to distinguish various sources of increased occupational mobility in transitional Russia. The key question is what is the nature of these sources? Are they destructive or creative? In other words, do people decide to change occupation because they are forced to do it as a result of the destruction of their current job and occupation ($r_i K_i^* \downarrow$) or because they find new alternatives more attractive ($r_j K_j^* \uparrow$)?

5. EMPIRICAL SPECIFICATION OF THE MODEL

In this section, we begin by defining explanatory variables that are used as proxies for the following model's parameters: returns to the current occupation, returns to alternative occupations, the quality of the occupation-specific match, and mobility costs. We then estimate the determinants of occupational mobility. Unfortunately, the 1985 and 1991 RLMS data do not provide information on most individual characteristics, *i.e.*, earnings and tenure. Hence, the model is estimated for the 1994–1998 period, for which complete data are available.

Returns to the Current and Alternative Occupations. Computations of returns to the current and alternative occupations are based on the following earnings equation:

$$\ln(WG) = \beta_0 + \beta_1 \ln(HR) + \beta_2 AGE + \sum \alpha_i OCC_i + \sum \gamma_i OCC_i AGE + u, \quad (4)$$

where ln(*WG*) is log of the contractual monthly wage at the primary job[5]; ln(*HR*) is log of monthly working hours, OCC_i is a set of occupational dummy variables (9 categories). To allow for possible age effects, the interaction terms are included.

Thus, for an individual employed in occupation *i* in 1994 the returns to his/her current occupation are computed as CUR = $\alpha_i + \gamma_i AGE$. The expected returns to alternative occupations are imputed as a weighted average of the returns to all other occupations: ALT = $\sum_j (\alpha_j + \gamma_j AGE) P_{ij}$ for $j \neq i$, where P_{ij} denote the probability of transition from occupation *i* to occupation *j* estimated for the previous period 1991–1995 to avoid an endogeneity problem.

Because the exact time of mobility decision is unknown two earnings equations are estimated for 1994 and 1998, years prior to and after mobility decision. This will allow us to test whether people respond to past returns to the current and alternative occupations (the adaptive expectation approach) or to their expectations regarding occupational returns in the future (the rational expectation approach).

Shifters of Returns to the Current and Alternative Occupations. Perhaps the most challenging variable affecting the returns to alternative

[5] The contractual wage takes wage arrears into account. It is imputed in the following way. For workers with wage arrears, the contractual wage is the total wage debt owed to the worker divided by the number of monthly wages owed. For workers without wage arrears the contractual wage is the actual monthly wage received last month from primary job (for detailed description see Earle and Sabirianova, 1998).

occupations is the skill transferability across occupations. The theoretical model predicts an unambiguous positive effect of the skill transferability on the probability of occupational switching. But empirically it is not obvious how to measure a degree to which individual skills are transferable across occupations. One way to think about the skill transferability is to see whether an individual can use his/her skills in different occupations. Assume that a field (or school major) that an individual has chosen in the previous system reflects his/her initial skills. These skills would be transferable if an individual could use them in other occupations. If engineers are able to work as managers or as sellers in a market economy, they may not use their field–specific knowledge but their general skills are certainly transferable. Following this idea, we have constructed a skill transferability index (STI) that shows the unconditional probabilities of working in another occupation for every school major in 1994.

Returns to the current and alternative occupations are also affected by the demand shocks at the sectoral, firm, and local levels. To control for the demand shocks, we utilize several available firm characteristics and local measures of job creation and destruction.

Three economic sectors (industry, agriculture, and services) are introduced in the empirical specification of the model to capture the sectoral demand shocks (SEC). These sectors are defined on the basis of the 5-digit industry classification system.

The only appropriate firm characteristic that can be drawn from the RLMS data for the whole employed sample is firm ownership.[6] Four ownership categories were created (OWN): state, domestic private, mixed and foreign. In the RLMS, only respondents working in firms (institutions with more than one employee) answered questions on ownership. For people working in industrial firms we obtained ownership information from the Goskomstat Registry of Industrial Firms. For respondents working in non-industrial firms we followed two approaches. If there were several respondents working in the same firm, we measured ownership based on the majority opinion of the respondents or on the answer of a high-ranking individual within the firm. In this way, the ownership measure is consistent across all workers in the firm. If there was only one person working in the firm, we used that person's responses to questions about ownership. Respondents not working in a firm but involved in individual businesses such as entrepreneurs, farmers, individual salespersons, *etc*. were added to the category of domestic private ownership.

[6] Other measures of firm performance will be exploited later for a smaller sample of industrial firms linked to the RLMS employees.

Two other variables are utilized to capture the effect of local job destruction and creation process on occupational mobility: the local job destruction rate in industrial sector defined at district level (JDR) and the 1998 share of the employed in de novo firms founded between 1994 and 1998 (NEW).

To estimate the job destruction rate in industry we use the Goskomstat Registry of Industrial Firms. The job destruction rate is calculated as the ratio of gross job destruction that occurred in a given district (raion) between t and $t-1$ to the total district employment in $t-1$. By using the standard formula, gross job destruction equals employment losses summed over all firms that contract in a given district between t and $t-1$. We expect this variable to have a positive effect on the probability of occupational switching.

The local share of workers in newly created firms (NEW) is included into the model as a measure of positive labor demand changes in the local labor market. In contrast to the job destruction rate in industry, which mainly reflects separations from old-type jobs, the second measure is designed to show how the creation of new job options affects occupational mobility. The 1998 share of employed people in de novo firms (firms founded between 1994 and 1998) is computed for each district based on the RLMS question about the founding date.

The Quality of the Occupation-Specific Match. The third model parameter is *the quality of the occupation-specific match* (ε_i). Unfortunately, the common measure of the occupation-specific match, such as experience in the same occupation, is not available. Instead, we constructed a dummy variable indicating whether a respondent had experience in the same occupation three years prior to 1994.

Mobility Costs. A set of individual and local characteristics is used to control for *individual mobility costs and outside opportunities* (c). Among individual characteristics (X) are gender, schooling, tenure and actual experience. The theoretical model provides an ambiguous prediction of the schooling effect on occupational mobility. On the one hand, higher education is more specialized and it has a larger occupation-specific component. The cost of occupational switching is higher for more educated individuals due to a possible loss of occupation-specific investment. On the other hand, individuals with more schooling face greater opportunities. Thus, the total effect of schooling on mobility is ambiguous.

With respect to tenure, our prediction comes from job-matching and career development theory. Tenure is expected to have a negative ef-

fect on interfirm occupational mobility due to a loss of firm-specific investment and accumulation of job-specific information but a positive effect on intrafirm occupational mobility due to career development and promotion reasons (see Sicherman and Galor, 1990). With respect to the actual labor market experience, we expect this variable to restrain occupational mobility.[7]

The concentration index of local industrial employment (The Herfindahl Index) (CON) is chosen to reflect the outside opportunities for occupational mobility. It is computed as the sum of squared shares of employment of industrial firms in the RLMS district (county). The employment of firms is taken from the 1994 Goskomstat Registry of Industrial Firms. The employment concentration index serves as a measure of competitiveness of employers in the local labor market: a higher value for the index means fewer job options. We hypothesize that limited outside opportunities and a high concentration of regional employment in a few firms should restrict interfirm occupational mobility.

Model. Thus, the model is specified empirically as follows:

Prob $(V_j - V_i > c)$ = f (CUR, ALT, STI, JDR, NEW, CON, SEC, OWN, OCCTEN, X),

where CUR — returns to the current occupation,

ALT — returns to alternative occupations,

STI — skill transferability index,

JDR — local job destruction rate of industrial firm,

NEW — local share of workers in de novo firms,

CON — industrial employment concentration index,

SEC — a set of sectoral dummies,

OWN — a set of ownership dummies,

X — vector of individual characteristics.

The estimates of this model are provided in the next section.

[7] The measure of actual labor market experience is available only in the 1998 data. For 1994 the actual experience variable was constructed as the actual labor market experience in 1998 minus 4. This measure does not omit the non-working spells between 1994 and 1998. Despite this drawback, we think that it is a better measure of experience than the potential labor market experience computed as age minus schooling minus 6.

6. DETERMINANTS OF OCCUPATIONAL MOBILITY

Below we present the estimates of the occupational mobility model. Table 6 provides the sample mean and standard deviation of each independent variable used in our analysis. It also contains two specifications of the probit equation for occupational mobility between 1994 and 1998. The first specification represents the adaptive expectations approach based on past returns to the current and alternative occupations (1994) while the second one represents the rational expectations approach based on future returns (1998). The results are extremely satisfactory and strongly support most of testable hypotheses.

Table 6. Determinants of Occupational Mobility, 1994–1998, Probit Estimates.

Independent variables	Mean [SD]	Probit, M.E. (1)	Probit, M.E. (2)
Returns to the current occupation, 1994	10.959 [0.317]	−0.052 (−1.475)	
Returns to alternative occupations, 1994	9.657 [0.942]	0.042*** (3.286)	
Returns to the current occupation, 1998	4.381 [0.317]		−0.130*** (−3.542)
Returns to alternative occupations, 1998	3.814 [0.385]		0.131*** (4.215)
Skill transferability index (STI)	0.436 [0.289]	0.078* (1.687)	0.082* (1.787)
STI missing	0.149	0.008 (0.216)	0.011 (0.326)
Male	0.462	0.065*** (3.014)	0.074*** (3.471)
Schooling (years)	11.939 [2.484]	−0.001 (−0.108)	0.004 (0.695)
Actual experience (years)	19.429 [10.554]	−0.003*** (−2.752)	−0.003*** (−3.252)
Tenure (years)	9.024 [8.692]	−0.003** (−2.318)	−0.003** (−2.050)
Experience in the same occupation (dummy)	0.690	−0.144*** (−6.604)	−0.151*** (−6.899)
Sector (service is omitted)			
Industry	0.290	0.037 (1.485)	0.033 (1.309)
Agriculture	0.137	0.119*** (3.708)	0.111*** (3.461)

Continued from p 25

Independent variables	Mean [SD]	Probit, M.E. (1)	Probit, M.E. (2)
Ownership (private firms are omitted)			
State ownership	0.525	−0.103*** (−3.661)	−0.108*** (−3.859)
Mixed ownership	0.317	−0.097*** (−3.319)	−0.098*** (−3.357)
Foreign ownership	0.013	−0.066 (−0.790)	−0.063 (−0.735)
Employment concentration index 94	0.176 [0.148]	−0.139* (−1.890)	−0.127* (−1.737)
Job destruction rate 1994/1995	0.082 [0.036]	0.496* (1.722)	0.494* (1.732)
Employment share in de novo firms	0.160 [0.081]	0.199* (1.662)	0.210* (1.746)
$Chi^2(17)$		239.45	263.09
Pseudo R^2		0.0879	0.1005

Note: *** — significant at the 1% level, ** — significant at the 5% level, * — significant at the 10% level; t-statistics are in parentheses, standard deviations are in brackets; t-statistics are defined with robust standard errors.

Sample consists of respondents employed in 1994 and 1998. N = 2318. Coefficients show the marginal effects. Individual and firm characteristics reflect 1994 conditions prior to mobility decision.

The probability of occupational switching increases with returns to alternative occupations prior to and after mobility decision. In other words, people respond to new opportunities and returns to alternative options. People also respond to future changes in returns to their own occupation. The insignificant, although negative, coefficient on the 1994 returns to the current occupation suggests that the returns based on past experience are less important determinant of occupational mobility than the expectations regarding future returns.

The skill transferability across occupations appears to facilitate occupational mobility. Experience in the same occupation, actual labor market experience, and tenure have a strong negative impact on the probability of occupational mobility. It may reflect an increase in the quality of the occupation-specific match and an increase in mobility costs as people gain more experience. The coefficient on schooling is not statistically significant. It could be due to the ambiguous effect of schooling on mo-

bility that was discussed above. Males tend to switch occupations more often.

Firm characteristics are found to be an important determinant of occupational flows. Occupational mobility is more likely to occur in agriculture as opposed to services, but is less likely to occur in state and mixed firms as opposed to domestic private and foreign businesses.

The estimated coefficients on the proxies for the local job destruction and creation process are consistent with the model's predictions. Both the local job destruction rate in industry and the employment share in newly created firms appear to have a significant and positive effect on occupational mobility. Among other local controls, the industrial employment concentration index is negatively related to occupational mobility. This finding suggests that poor outside alternatives reduce the opportunities for occupational mobility.

Thus, the data show that both processes, one creative and one destructive, are taking place. To compare the mobility effects of creative and destructive factors, we have simulated the probit equations in Table 6. The results of simulations appear in Table 7. A 10% decrease in returns to the current occupation brings about more occupational mobility than a 10% increase in returns to the alternative occupations. Similarly, a 10% increase in the local job destruction rate in the industrial sector resulted in more occupational changes than a 10% increase in the local share of employment in newly created firms. The decomposition analysis implies that a relatively large part of occupational mobility in the transition period is driven by the destructive forces, such as a decline in returns to the current occupation and industrial job destruction.

In Table 8 we also estimate a multinomial logit model to test whether our explanatory factors have a similar effect on the probability of intra- and interfirm occupational switching between 1994 and 1998. For an employed respondent in 1994, three possible outcomes are considered: to remain in the same occupation (72%), to change occupation within a firm (9.4%), or to change occupation and firm (18.6%). The first category is chosen to be the reference category.

Evidently there are clear differences between the three outcomes. We find that compared to the option of remaining in the same occupation, returns to the current occupation have a significant negative impact on the probability of interfirm occupational mobility. At the same time low returns to alternative occupations restrain people from switching occupations both within and across firms.

Experience in the same occupation is the only individual characteristic that has a statistically significant marginal effect on the probability of in-

trafirm occupational mobility. Males are more likely to switch both occupation and firm. Interfirm occupational mobility is associated positively with years of schooling and negatively with experience in the same occupation and total labor market experience. The effect of tenure is consistent with job-matching and career development hypotheses: tenure has a negative impact on the occupational switching between firms but a positive, although insignificant, effect on intrafirm occupational mobility.

Table 7. Creative and Destructive Factors in Occupational Mobility, A Decomposition Analysis.

	Percentage change in probability of occupational mobility	
	(1)	(2)
10% increase in returns to alternative occupations	21.4%	29.7%
10% decrease in returns to the current occupation	31.0%	35.9%
10% increase in the local share of employment in newly created firms	1.8%	2.0%
10% increase in the local job destruction rate in the industrial sector	2.3%	2.4%

Note: The contribution of each factor is calculated from the probit equations presented in Table 6.

Table 8 shows that interfirm occupational mobility is likely to occur for those employed in private and foreign firms, but intrafirm career movements are peculiar to agricultural firms and companies with mixed ownership. The local measure of job destruction is found to increase the probability of intrafirm occupational mobility while the employment share in de novo firms has a positive effect on the probability of interfirm occupational mobility. Finally, the estimates strongly support the monopsony power hypothesis. In monopsonistic labor markets, occupational mobility exists mainly in the form of intrafirm mobility. These are markets that, as a rule, have a limited choice of upper class occupations (professionals), and they provide restricted opportunities for training and retraining. As Table 8 indicates, the probability of interfirm occupational changes is smaller in markets with poor outside options and a large employment concentration in big firms.

Table 8. Determinants of Intra- and Interfirm Occupational Mobility, 1994–1998, MNL Estimates.

Independent variables	Intrafirm occupational mobility	Interfirm occupational mobility
Returns to the current occupation, 1998	−0.002	−0.127***
	(−0.080)	(−4.416)
Returns to alternative occupations, 1998	0.034*	0.091***
	(1.646)	(3.626)
Skill transferability index (STI)	0.027	0.045
	(1.004)	(1.207)
STI missing	−0.005	0.018
	(−0.263)	(0.616)
Male	−0.006	0.077***
	(−0.466)	(4.574)
Schooling (years)	−0.004	0.009**
	(−1.221)	(2.005)
Actual experience / 100 (years)	−0.008	−0.318***
	(−0.134)	(−4.095)
Tenure /100 (years)	0.128	−0.458***
	(1.602)	(−3.966)
Experience in the same occupation (dummy)	−0.062***	−0.076***
	(−4.571)	(−4.556)
Sector (service is omitted)		
Industry	0.017	0.019
	(1.105)	(0.949)
Agriculture	0.090***	−0.006
	(5.221)	(−0.234)
Ownership (private firms are omitted)		
State ownership	0.022	−0.101***
	(1.085)	(−4.971)
Mixed ownership	0.035*	−0.104***
	(1.680)	(−4.961)
Foreign ownership	0.030	−0.074
	(0.566)	(−1.162)
Employment concentration index 94	0.006	−0.142**
	(0.140)	(−2.400)
Job destruction rate 94/95	0.330*	0.106
	(1.881)	(0.466)
Employment share in de novo firms	−0.064	0.237***
	(−0.813)	(2.586)
Intercept	−0.260*	0.089
	(−1.772)	(0.486)
$Chi^2(34) = 386.04$ Pseudo $R^2 = 0.1089$		

Note: *** — significant at the 1% level, ** — significant at the 5% level, * — significant at the 10% level; t-statistics are in parentheses; t-statistics are defined with robust standard errors.

Sample consists of respondents employed in 1994 and 1998. N = 2318. Coefficients show the marginal effects. The reference category is no occupational mobility.

Thus, the results here support the model hypothesis. Consistent with the model, the decision to switch occupations depends not only on individual characteristics but also on market returns, local opportunities and the scale of structural change.

7. DOWNWARD OCCUPATIONAL MOBILITY AND FIRM PERFORMANCE

In the transition context another important issue concerns the directions of occupational mobility. Where do people move? Does their new occupation represent the next step in their career advancement or is it the first step in a completely different field? We argue that unexpected demand shifts may increase the number of unconventional career switches, including downward occupational mobility. Changes in the demand for occupation-specific skills and overall changes in wage distributions across occupations may induce people to end their old careers regardless of how successful were they under the previous system and to begin a new career in a completely different field with lower skill requirements.

As can be seen in Table 9 the distance between the field of previous study and new occupation becomes larger. A considerable number of people choose new occupation that does not correspond to their previous education. In 1998, that only 38.9% of engineering graduates are among professionals is remarkable. Some of engineers move up and become managers and entrepreneurs. But some of them accept jobs of laborers and service workers with lower skill requirements. The important question is whether these downward switches are voluntary or they represent some form of labor adjustment to negative demand shocks. To answer this question, we take a closer look at the downward occupational mobility in connection with firm performance.

To start with, downward occupational mobility can be defined as a movement down the skill ladder to an occupation requiring less skill than the previous occupation. The open issue is how to define the skill ladder or how to rank occupations. One approach is to construct an occupational index based on the amount of human capital needed to work in different occupations (an example of such an index is shown by Sicherman and Galor, 1990). Another approach is to rank occupations according to their monetary returns, computed from an earnings equation with a set of occupation dummies. Because downward (upward) occupational mobility is commonly associated with downward (upward) income mobility, both methods typically produce a similar vertical ranking of occupations. However, as we will demonstrate further, it may not be true in a highly unstable environment when occupations with high human capital requirements could lose their monetary value.

Table 9. Occupational Distribution by School Major, 1985–1998.

Panel A. Occupational Distribution by University Major.

School Major	Percentage distribution of occupations by university major				
	Managers	Professionals	Associate professionals	Clerks and service workers	Production workers
Mathematics and physics					
1985	0.00	81.25	10.42	2.08	6.25
1991	1.96	74.51	5.88	7.84	9.80
1998	5.56	62.50	18.06	5.56	8.33
Engineering					
1985	7.77	63.27	12.60	3.75	12.60
1991	8.77	57.82	14.22	4.03	15.17
1998	16.58	38.86	17.82	8.42	18.32
Life science and medicine					
1985	1.80	80.18	10.81	4.50	2.70
1991	3.28	81.97	6.56	4.92	3.28
1998	5.88	75.74	8.09	5.15	5.15
Education					
1985	2.56	69.23	17.95	7.05	3.21
1991	3.55	69.23	14.79	6.51	5.92
1998	7.88	67.00	11.33	5.42	8.37
Business and law					
1985	3.57	55.36	26.79	4.46	9.82
1991	6.38	46.81	28.37	8.51	9.93
1998	14.86	46.29	19.43	13.14	6.29
Other university majors					
1985	10.00	68.33	16.67	3.33	1.67
1991	8.62	68.97	17.24	1.72	3.45
1998	11.43	51.43	15.71	15.71	5.71
Military schools					
1985	0.00	93.33	6.67	0.00	0.00
1991	4.35	91.30	0.00	0.00	4.35
1998	11.76	64.71	11.76	11.76	0.00

Note: for each year the distribution is estimated for a sample of workers 22 years and older.

Continued from p. 31

Panel B. Occupational Distribution by Technical and Vocational School Major.

School Major	Percentage distribution of occupations by technical and vocational school major				
	Managers	Professionals	Associate professionals	Clerks and service workers	Production workers
Technical science					
1985	2.24	10.77	24.80	11.38	50.81
1991	2.02	8.43	23.95	14.17	51.43
1998	4.76	2.29	25.75	19.05	48.15
Life science and medicine					
1985	1.69	3.95	64.41	12.99	16.95
1991	2.13	4.79	63.83	10.64	18.62
1998	3.55	2.03	71.57	9.14	13.71
Education					
1985	2.86	5.71	68.57	5.71	17.14
1991	3.61	6.02	65.06	8.43	16.87
1998	5.68	1.14	57.95	19.32	15.91
Business and law					
1985	1.06	8.99	48.15	34.92	6.88
1991	0.98	6.34	54.15	32.68	5.85
1998	3.57	0.00	48.47	38.27	9.69
Other technicum major					
1985	3.45	10.34	48.28	3.45	34.48
1991	7.14	10.71	35.71	14.29	32.14
1998	8.33	8.33	30.56	13.89	38.89
Clerical work					
1985	0.00	4.76	14.29	38.10	42.86
1991	0.00	5.00	17.50	37.50	40.00
1998	0.00	0.00	15.38	55.77	28.85
Service work					
1985	0.00	1.14	11.36	65.91	21.59
1991	0.00	0.89	4.46	63.39	31.25
1998	2.40	0.00	1.60	53.60	42.40

Continued from p. 32

School Major	Percentage distribution of occupations by technical and vocational school major				
	Managers	Professionals	Associate professionals	Clerks and service workers	Production workers
Craft work					
1985	0.00	0.68	3.39	7.69	88.24
1991	0.20	0.60	3.58	9.94	85.69
1998	2.28	0.91	2.51	13.44	80.87
Operator work					
1985	0.00	0.54	1.63	7.07	90.76
1991	0.00	0.42	2.12	5.51	91.95
1998	2.07	0.00	2.48	9.50	85.95

Note: for each year the distribution is estimated for a sample of workers 22 years and older.

In this study two vertical rankings are constructed: (1) ranking based on the amount of schooling and training required to work in each occupation (the schooling ladder) and (2) ranking based on the average monetary returns to these occupations (the earnings ladder).

The schooling ladder is first derived by regressing log of contractual monthly earnings on years of schooling for seven types of education[8] and a dummy for training in the same field controlling for industries, locations, hours of work, gender, and experience. Then the ranking is constructed as a weighted average of occupational means for all schooling and training variables where weights are the coefficients from the earnings equation:

$$\ln(WG_{ijt}) = X_{it}\beta + S_{it}\gamma + \tau T_{it} + u_{ijt},$$

$$R_j^{SCH} = \sum_j (S_{it}\gamma + \tau T_{it}) / N_j,$$

[8] Seven types of education are secondary education, professional courses, vocational schools without a secondary education, vocational schools with a secondary education, technical schools, undergraduate and graduate university programs.

where $\ln(WG_{ijt})$ is log of the contractual monthly wage at the primary job for an individual i employed in occupation j at time t; X_{it} is a vector of observed characteristics such as industry, location, hours of work, gender, and experience for an individual i at time t; S_{it} is a vector consisting of seven schooling duration variables; T_{it} is a dummy indicating whether an individual received additional training in the same field; R_j^{SCH} is a ranking index for occupation j; N_j is a number of respondents in occupation j. The difference between two ranking indexes shows the vertical distance between two occupations.

The earnings ranking is imputed from the coefficients on occupation dummies in the earnings equation after controlling for industries, locations, hours of work, gender and experience.

$$\ln(WG_{ijt}) = X_{it}\,\beta + \sum \alpha_j\, OCC_j + u_{ijt},$$

$$R_j^{EARN} = \alpha_j,$$

where OCC_j is a set of occupational dummies.

Table 10 shows ranking indices and ranks of 28 (2-digit) occupation categories according to the schooling ladder and the earnings ladder in 1998. Although the correlation between the two ranking indices is high (ρ=0.7459), we observe some discrepancies between them. For instance, entrepreneurs with relatively little schooling are located high on the earnings ladder. At the same time, engineers or health professionals have a lower place on the earnings ladder compared to the schooling ladder. In other words, the movement up on the schooling ladder is not necessarily associated with upward mobility on the earnings ladder.

Table 11 highlights the trends in downward and upward occupational mobility during the transition period. Apparently, the transition period brings about more downward switches on the schooling ladder. People move to occupations that on average require less years of schooling (for example, the transition from engineer or technician to a seller or guard is very common).

Our next step is to test whether downward occupational mobility represents a form of labor adjustment to negative demand shocks. We can test it by using the matched worker-firm data, which includes more detailed firm-level information. The purpose of these estimates is to see if poor firm performance increases the likelihood of downward switches.

Table 10. Vertical Rankings of Occupations, 1998.

	Schooling ladder		Earnings ladder	
	Ranking index	Rank	Ranking index	Rank
Life science and health professionals	0.813	1	0.944	5
Teaching professionals	0.753	2	0.943	6
Business and law professionals	0.722	3	0.991	2
Physicists, mathematicians, and engineers	0.718	4	0.805	9
Officials	0.682	5	0.976	3
Other professionals	0.642	6	0.872	7
Corporate managers	0.641	7	0.969	4
Small firm managers	0.583	8	0.804	10
Military specialists	0.517	9	0.867	8
Finance and business associate professionals	0.508	10	0.621	13
Teaching associate professionals	0.445	11	0.606	15
Technicians	0.444	12	0.700	11
Life science and health associate professionals	0.410	13	0.513	17
Other associate professionals	0.403	14	0.668	12
Entrepreneurs and farmers	0.399	15	1.328	1
Protective services workers	0.397	16	0.617	14
Office clerks	0.363	17	0.421	23
Customer services clerks	0.351	18	0.330	24
Metal and machinery workers	0.308	19	0.500	18
Stationary-plant operators	0.308	20	0.469	22
Salespersons	0.307	21	0.323	25
Catering services workers	0.290	22	0.149	26
Extraction and building trades workers	0.286	23	0.524	16
Other craft workers	0.278	24	0.487	20
Elementary occupations	0.264	25	0.093	27
Machine operators and assemblers	0.256	26	0.496	19
Personal services workers	0.256	27	0.000	28
Drivers and mobile-plant operators	0.255	28	0.476	21

Note: Occupations in this table represent two-digit occupational categories.

Table 11. Downward *vs*. Upward Occupational Mobility.

	1985–1998	1985–1991	1991–1998
Gross occupational mobility (Table 3)	0.497	0.219	0.422
Schooling Ladder			
Occupational mobility			
Downward switches	0.232	0.095	0.194
Upward switches	0.191	0.090	0.158
Horizontal switches	0.074	0.035	0.070
Average change in occupational schooling differentials	−0.023	−0.006	−0.021
Downward switches	−0.128	−0.095	−0.129
Upward switches	0.096	0.086	0.103
Earnings ladder			
Occupational mobility			
Downward switches	0.233	0.101	0.193
Upward switches	0.190	0.083	0.158
Horizontal switches	0.074	0.035	0.070
Average change in occupational wage differentials	−0.036	−0.032	−0.029
Downward switches	−0.264	−0.224	−0.270
Upward switches	0.231	0.189	0.254

Note: Horizontal switches are fractions of employed respondents who changed occupation within a two-digit occupational group.

Table 12 shows the marginal effect of various firm performance measures on the probability of downward occupational mobility from several alternative probit equations. The firm performance variables include one-year changes in nominal output and employment, longer-term (two- and four-year) changes in these two variables, the profitability, and the own sources per output, all drawn from the Goskomstat Registry of Industrial Firms and Short Balance Sheets. In most cases, the firm performance measures are estimated to have the hypothesized impact on the probability of downward occupational mobility: a better performance implies a lower probability. Thus, the data support the hypothesis that workers respond to negative demand shocks and poor firm performance by choosing occupations with lower skill requirements.

Table 12. The Impact of Alternative Measures of Firm Performance on Downward Occupational Mobility (Matched Worker-Firm Sample).

Firm performance measures	Mean	Standard deviation	Downward mobility on the schooling ladder		Downward mobility on the earnings ladder	
			dF/dX	z	dF/dX	z
Short-term nominal output growth, Log(OUT_t / OUT_{t-1})						
1994–1995	0.957	0.460	−0.080*	−1.870	−0.086*	−1.932
1995–1996	0.107	0.543	−0.053**	−2.055	−0.026	−0.960
1996–1997	−0.038	0.619	−0.051*	−1.929	−0.051**	−2.000
Short-term employment growth, Log(EMP_t / EMP_{t-1})						
1994–1995	−0.064	0.176	−0.074	−0.759	−0.163	−1.578
1995–1996	−0.062	0.279	−0.232**	−2.308	−0.249**	−2.364
1996–1997	−0.149	0.210	−0.264***	−3.094	−0.200**	−2.538
Long-term nominal output growth						
1994–1996	1.073	0.680	−0.076***	−2.984	−0.059**	−2.265
1992–1996	4.010	0.882	−0.074***	−3.830	−0.074***	−3.380
1993–1997	2.015	0.985	−0.066***	−3.425	−0.066***	−3.304
Long-term employment growth						
1994–1996	−0.127	0.363	−0.126***	−2.597	−0.150***	−2.788
1992–1996	−0.209	0.400	−0.124**	−2.531	−0.140***	−2.606
1993–1997	−0.391	0.545	−0.137***	−3.515	−0.128***	−3.479
Profitability ($PROFIT_t$ / OUT_t)						
1994	0.231	0.664	0.001	0.023	−0.010	−0.263
1995	0.101	0.258	−0.165***	−2.647	−0.216***	−3.122
1996	0.086	0.557	−0.187***	−3.681	−0.173***	−3.347
1997	0.053	5.120	−0.043***	−4.045	−0.044***	−3.891
Own sources per output (IST_t / OUT_t)						
1994	1.913	3.424	0.001	0.392	0.003	0.663
1995	5.386	5.973	0.005*	1.838	0.006**	2.005
1996	5.299	9.492	0.004**	2.315	0.004**	2.231

Notes: *** — significant at the 1% level, ** — significant at the 5% level, * — significant at the 10% level; t-statistics are defined with robust standard errors.

Each row of the table shows the marginal effect of a measure of firm performance on the probability of downward occupational mobility between 1994 and 1998. Other controls included (but not shown here) are gender, education, actual experience, tenure, type of ownership, industrial employment concentration index, local job destruction rate in industry, the 1998 share of the employed in firms created after 1994. Full tables are available by request. Sample is restricted to employees linked to industrial firms. The sample size varies from 351 to 523 respondents.

8. WAGE RETURNS TO OCCUPATIONAL MOBILITY

We have hypothesized that the restructuring process during the transition to a market economy brings several factors of occupational mobility into play. On the one hand, occupational mobility can be forced by the negative demand shocks and the destruction of existing jobs ("destructive" theory). On the other hand, the increased demand for the new type of skills can create additional incentives to exploit new opportunities and to switch careers ("creative" theory).

Another way to examine the importance of different sources of increased occupational mobility in transition economies is to look at the wage returns of occupational mobility. The "destructive" theory of

Table 13. Wage Returns to Occupational Mobility, IV Regression Estimates, 1994–1998.

Independent variables	Logarithmic nominal wage growth, OLS	
	Coeff.	*t*
Growth rate of hours of work, 1994–1998	0.166***	4.272
Occupational mobility (predicted probability)	−0.426**	−2.104
Male	−0.048	−0.956
Schooling / 100 (years)	0.052	0.050
Actual experience / 100 (years)	−0.711***	−2.679
Tenure (years)	−0.011***	−3.448
Employment concentration index 94	−0.436***	−2.762
Job destruction rate 94/95	−0.032	−0.047
Employment share in de novo firms	0.083	0.268
Intercept	1.712***	9.436
Mean	1.283	
S.D.	[0.962]	
N	1645	
R^2	0.0336	
	F(9, 1635) = 6.80	

Note: *** — significant at the 1% level, ** — significant at the 5% level, * — significant at the 10% level; t-statistics are defined with robust standard errors.

Sample consists of respondents employed in 1994 and 1998. Wage growth is the difference in log of contractual monthly wages for the primary job between 1994 and 1998. Instruments for occupational mobility include variables in the last column in Table 6.

occupational mobility suggests that people who are forced to move may lose earnings they had in the previous occupation. If the destructive hypothesis were true, then wages could be lower than they were before a career change.

In contrast, the "creative" theory of occupational mobility suggests that the voluntary occupational switches in response to positive demand shifts and new opportunities bring additional benefits to an individual. If the creative hypothesis were true, then we would expect workers to gain in terms of their wages as a result of occupational switching.

We test these hypotheses by estimating the returns to occupational mobility in terms of subsequent wage growth. To take the endogeneity bias into account, we use the instrumental variable method. The method is to construct predicted values for occupational mobility and examine the impact of these constructed measures on wage growth. The predicted values for occupational mobility are computed from the selection equation presented in the last column in Table 6. The skill transferability index is the key instrument, which is unlikely to have any independent effect on wage growth.

Table 13 shows that occupational mobility reduces wage growth. Again data appear to support the "destructive" theory of occupational mobility during the transition period.

9. CONCLUSIONS

This study has made a first attempt to inquire into the magnitude, determinants, and consequences of occupational mobility in transitional Russia from 1985 to 1998. The restructuring environment in general, and Russia in particular, represents a good basis to study occupational mobility as an individual behavioral response to structural economic shocks in the labor market. We admit that occupational mobility in transitional economies, like in any other, could be due to the poor quality of the occupation-specific match, career development or any other reasons. However, as we show in this study, structural shifts could also induce people to change their career despite a good occupational match or a well-established career.

In this chapter we show that the restructuring process increases the rate of occupational reallocation. Structural changes account for a substantial part of the increase in gross occupational flows. At the same time, we observe differences in the empirical patterns of occupational mobility during the early and late stages of the transition period, with

more intense flows and larger structural reallocation in the earlier years. We have also documented considerable flows to service-providing occupations and an increase in downward occupational mobility.

A model of occupational switching outlines the major explanatory factors of increased mobility during transition. The model predicts that the probability of occupational change increases with a decline in the returns to current occupation, with an increase in the returns to alternative occupations, with the transferability of skills between occupations, with lower mobility costs, and with lower quality of the occupation-specific match in current occupation

We analyze two competing explanations of increased occupational mobility during the economic transition. On the one hand, occupational mobility can be forced by the negative demand shocks, a decline in returns to the current occupation, and the destruction of existing jobs ("destructive" theory). On the other hand, increased occupational mobility may reflect the creation of new opportunities and the increased demand for new type of skills ("creative" theory). We show that both explanations are taking place in transitional Russia, although destructive sources have a larger impact on occupational mobility.

Empirical analysis demonstrates that the probability of occupational switching is strongly affected by a decline in returns to a previous occupation and an increase in returns to alternative options. We examine also various individual and firm characteristics. The econometric results indicate that occupational mobility falls with tenure, experience in the same occupation, and total labor market experience. Firm characteristics such as type of ownership, firm industry, and firm performance are also found to be an important determinant of occupational change.

We show that downward occupational mobility can be considered as a form of labor adjustment to negative demand shocks. Empirical findings suggest that workers respond to negative shocks and poor firm performance by choosing occupations with lower skill requirements.

The econometric analysis also provides evidence that local labor market conditions, which reflect an uneven speed of structural changes and unequal outside opportunities across regions, are critical determinants of occupational shifts. Limited outside opportunities and the large concentration of local employment in a few firms restrict interfirm occupational mobility.

While this research is undertaken for one country, the conclusions are relevant for other emerging and transition markets where structural and technological changes cause substantial reallocation of human capital.

REFERENCES

Bauer, Th. and K.Z. Zimmermann (1999) Occupational Mobility of Ethnic Migrants, *IZA Working Paper,* No. 58

Berger, M., J. Earle and K. Sabirianova (January 2000) *Job Training in the Russian Restructuring Process* (Mimeo)

Boeri, T., M. Burda and J. Kollo (1998) *Mediating the Transition: Labour Markets in Central and Eastern Europe*, in: L. Ambrus–Lakatos and M.E. Schaffer, eds., Forum Report of the Economics Policy Initiative No. 4

Boeri, T. and Ch.J. Flinn (1999) Returns to Mobility in the Transition to a Market Economy, *Journal of Comparative Economics* **27** (1), 4–32

Dolton, P.J. and M.P. Kidd (1998) Job Changes, Occupational Mobility, and Human Capital Acquisition: An Empirical Analysis, *Bulletin of Economic Research* **50** (4), 265–295

Goskomstat RF (1998) (Regional Yearbook)

Earle, J. (1998) Industrial Decline and Labor Reallocation in Romania, *SITE Working Paper*, No.125 (Stockholm)

Earle, J. and K. Sabirianova (1998) Understanding Wage Arrears in Russia, *SITE Working Paper*, No.139 (Stockholm)

Earle, J. and Z. Sakova (1999) Entrepreneurship from Scratch: Lessons on the Entry Decision into Self-Employment from Transition Economies, *SITE Working Paper*, No.145 (Stockholm)

Foley, M. (1997) Labor Market Dynamics in Russia, *Economic Growth Center Discussion Paper*, No.780

Ham, J., J. Svejnar and K. Terrell (1998) Unemployment and the Social Safety Net During Transitions to a Market Economy: Evidence from the Czech and Slovak Republics, *American Economic Review* **88** (5), 1117–1142

Jovanovic, B. and R. Moffitt (1990) An Estimate of a Sectoral Model of Labor Mobility, *The Journal of Political Economy* **98** (4), 827–858

Kertesi, G. and J. Kollo (1999) Economic Transformation and the Return to Human Capital: The Case of Hungary, 1986–1996, *Budapest Working Papers on the Labour Market,* June 1999

McCall, B. (1990) Occupational Matching: A Test of Sorts, *The Journal of Political Economy* **90** (1), 45–69

Neal, D. (1999) The Complexity of Job Mobility among Young Men, *Journal of Labor Economics* **17** (2), 237–261

Nesterova, D. and K. Sabirianova (1998) Investment in Human Capital under Economic Transformation in Russia, *EERC Working Paper*, No. 99/04

Orazem, P.F. and M. Vodopivec (1997) Value of Human Capital in Transition to Market: Evidence from Slovenia, *European Economic Review* **41** (3–5), 893–903

Rutkowski, J. (1997) Low Wage Employment in Transitional Economies of Central and Eastern Europe, *MOST* **7** (1), 105–130

Shaw, K. (1987) Occupational Change, Employer Change, and the Transferability of Skills, *Southern Economic Journal* **53** (3), 702–719

Sicherman, N. and O. Galor (1990) A Theory of Career Mobility, *The Journal of Political Economy* **98**, 169–192

Svejnar, J. (1999) *Labor Markets in the Transitional Central and East European Economies*, in: O. Ashenfelter and D. Card, eds., Handbook of Labor Economics, Vol. 3b (Amsterdam: Elsevier Science) 2809–2858